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## HOUSE FINCH (LINNET) CONTROL IN CALIFORNIA

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**ABSTRACT:** The house finch or linnet, *Carpodacus mexicanus frontalis* (Say) is a protected migratory nongame bird indigenous to California and found abundantly in all but the northern and mountainous areas. These finches attack more than twenty different crops and damage is demonstrated by fruit pecks, seed removal, and disbudding. When house finches cause agricultural damage control measures must be carried out under the general supervision of a county agricultural commissioner. Control practices involve the use of toxic baits, trap-decoy stations, and bio-acoustical devices. Most importantly, these control methods have been demonstrated to be safe, selective, and successful when employed by persons properly trained in the ecology of the species.

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### INTRODUCTION

The house finch *Carpodacus mexicanus frontalis* (Say) better known as the linnet is indigenous to California. The species is an abundant resident throughout most of the State - being most numerous in the warm valleys near the cultivated lands. The life history and status of the house finch has recently been compiled by Robert S. Wood (1968) and will not be dealt with here.

House finches are classified as migratory nongame birds and afforded protection under provisions of the Migratory Bird Treaty Act of 1918 and its subsequent amendments. There are also regulations in the California Fish and Game Code dealing with species protected by Federal treaty. The California Department of Agriculture has a circular (CDA 1968) available which is a compilation of the laws and regulations covering bird control in this State. Let me mention, however, that provisions in the Code of Federal Regulations (Title 50 - Wildlife and Fisheries Part 16) allow for the control of house finches and other designated species when they are causing agricultural damage. In California (Section 16.23 of the Code) these control measures must be carried out under the general supervision of the local County Agricultural Commissioner. The California Department of Agriculture and the County Agricultural Commissioners have promulgated a policy statement (CPS-V2, 1968) dealing with State and county responsibilities relative to the control of injurious birds. The stated aims of these two agencies are: "Conservation, crop protection, and preservation of public welfare". The purpose of this paper is to review house finch control practices used in California. I am greatly indebted to the many county agricultural commissioners and their personnel who aided me in learning what I consider sound bird control techniques. Especially, I wish to thank Mr. Jim Davis, Agricultural Commissioner of Madera County, and his staff for their efforts the past two years in helping me to conduct house finch control trials throughout the county. Also, I want to extend my appreciation to the owners of S & J Ranch, Mr. Hans Sumpf and Mr. Roger Jensen, as well as ranch foreman Jim Powell for their cooperation and aid in making a success of trials conducted there. In particular, I am grateful to Jim Koehler, Chief of Weed and Vertebrate Pest Control; Charles Siebe, Staff Bird Control Specialist; and my supervisor, Les Haworth, for their continuing support and guidance while conducting these investigations.

### HISTORY AND THE PROBLEM

The house finch has long been recorded (F. E. L. Beal, 1904; W. C. McAtte, 1932; E. Stone, 1948) as depredating crops here in California. More than twenty crops are mentioned by F. E. L. Beal (1907), Piper and Neff (1937), and Koehler (1962) as being depredated by this species. In 1938 all three parts of S. E. Piper and J. A. Neff's "Procedure and Methods in Controlling Birds injurious to Crops in California" were completed, thus aiding regulatory officers in the field of crop protection. This publication culminated six years of study relating to bird problems in the State and the methods proposed for house finch control are still valid and effective. Urbanization has caused some conflict, however, with the exposure of toxic baits, necessitating the development of alternative methods. Recent studies by Larsen and Carley (1966) and Larsen and Mott (1967) have stimulated work here in California to develop trapping-decoy stations as potential methods of finch control. Bio-acoustical devices (Boudreau - a, 1968 b, 1968 c; Av-Alarm Corp. 1968) also show promise in alleviating crop damage by this species. Each of these methods - toxic baits, trapping, and bio-acoustic - will be analyzed in respect to current use and field studies.

## CONTROL TECHNIQUES AND PROCEDURES

It is recognized that house finch depredation is usually localized and for that reason widespread campaigns to relieve the condition should not be undertaken. The relief sought should be confined to the area involved. In fact, the local habits and seasonal food preferences of this species are developed to a high degree and act to the advantage of those doing control work. The presence of house finches in an agricultural area, however, should not be taken as evidence that they are doing damage - look for signs of disbudding, seed removal, or fruit pecks before commencing control.

When practical and economical deterrent or repellent methods are known, individuals should be instructed in their use to the total exclusion of any destruction or killing methods. Since this is a discussion of control methods, bait formulas will not be supplied as they are already available to regulatory officers of government agencies involved in bird control. Some county departments of agriculture have handout sheets detailing procedures for house finch control - two good examples are those of Santa Cruz and Santa Clara Counties.

Control techniques and procedures described have been somewhat modified from those described by Piper and Neff (1937) and Koehler (1962). Some modifications became necessary in recent studies conducted in Madera County.

Bait materials should be exposed in shallow "V" shaped troughs, eight feet to ten feet in length, constructed of good grade 1 inch by 4 inch lumber. The 'manual' by Piper and Neff suggests that troughs be eight to ten feet in length, constructed of 1/4 to 1/2 inch wide redwood or pine. Whatever the case, both thicknesses work well if a good grade of lumber is used and the pieces are secured with nails and glue to prevent separation (this is important, so as to prevent spillage which would cause a hazard to non-target species such as dove). Treat the wood with a preservative to reduce warpage. Triangular braces can be used to strengthen the trough if necessary. William R. Clark (personal communication) suggests that one end of the trough be braced with a rectangular cap of 1" to 4" wood, six to eight inches in length, to act as a support, so as to prevent tipping, thus preventing spillage of the bait material during servicing. This idea proved to be advantageous to our work in Madera County where we were servicing up to 100 troughs a day. Use of the suggested materials makes a trough which is light in weight, easy to place in the crotch of a limb, and durable. Troughs should last for many years if properly constructed and maintained.

The shallow depth of these units allows for free feeding and vision by the birds, yet does not permit the bait to be blown out. There are two reasons for the considerable length: (1) the trough must reach across the center of the tree from one limb to another, and (2) as finches are rather belligerent and will not feed freely close together a small trough will not permit enough individuals to feed at one time.

The number of troughs needed depends entirely upon the number of house finches present and the extent of the area they are working. A common fault is the construction of too few troughs to adequately handle the work. The total area covered by house finch activity is more important in deciding on the number of troughs required than is the total population of birds.

For speedy crop protection the area of activity must be adequately covered. A guideline is: 4 to 5 acres - 10 troughs; 40 to 60 acres - 20 to 25 troughs; and 100 troughs adequately controlled finches in 800 acres of figs when the troughs were continually moved to coincide with bird activity.

Placing of bait troughs requires careful local observations. The bait must be taken to the birds - not placed outside their normal area of activity. Poorly located troughs will bring only slow results or total failure.

Troughs should be placed at least four feet high in the trees being attacked, in dead trees in the orchard, dead or living trees outside the orchard where finches habitually perch to rest, on standards between the trees, on wires slung between trees, on fence posts or wire fences, and on brush piles where the birds congregate -- IN FACT!, any location where these birds concentrate during the period of damage that the owner of the property has jurisdiction over.

Time and effort spent in observing the activity of the birds in relation to the placing of troughs is well spent. Learn the ecology of the species and let this guide you to a solution of the problem. One cannot readily attract these or other birds to food exposed in a

location where the species does not wish to go. Therefore, proper location of the troughs is the most vital item of the entire procedure.

Food used for the bait mixture consists of two types of seed: (1) Rape, usually Dwarf Essex variety, and (2) canary grass (*Phalaris*). Piper and Neff (1937) conducted extensive tests of a large number of seeds, checking both the acceptance of seed as noted, in bait trays and examining stomachs of birds killed at baiting stations. A standard bait mixture was developed which has successfully met most field needs.

A study was also made on the viability of weed seeds after ingestion by house finches (E. Roessler 1936). Considering the emphasis now placed on weed control, this work is very important. Little viability occurs, thus contamination of the orchard is usually confined to the site of baiting - this can easily be controlled.

Extensive prebaiting is necessary before any treated bait is exposed. Prebaiting will demonstrate that house finches are abundant and taking a food source that can be easily treated with a toxicant. It also indicates the amounts and proportions of rape and canary seed to mix for treatment.

Equal proportions of the two seed types should always be exposed in prebaiting. Only when this is done can it be established that one seed type is preferred over the other. Each seed will be hulled, the hulls falling back into the trough. CAREFUL inspection is necessary to determine seed consumption. The length of time necessary to develop acceptance is variable. If troughs are well situated, acceptance should be well established within a week.

Exposing the treated bait can take place when clean prebait is accepted freely at all or nearly all the troughs. The proportions of treated seed to be exposed should coincide with the acceptance observed in prebaiting. If prebaiting indicates house finches are feeding mostly on rape seed, there is no point in wasting canary seed or vice versa. It never pays to discard either seed totally - there are always a few birds feeding on the alternate. The treated seed should not be left in the troughs more than 24 hours, or the period of time necessary to span two consecutive peak feeding periods. Sometimes the greatest feeding activity (peak period) is in the morning, other times late afternoon.

Be sure house finches are taking the bait material. Many birds like canary grass seed, so be sure to make accurate observations so as to protect non-target species, especially mourning dove *Zenaidura macroura*. Rape seed is freely eaten by few birds so is naturally more selective, however, beware again of dove as they will also consume this seed. The process of exposing clean prebait and treated bait is then continued alternately until the birds are under control or the damage period is over. Successful prebaiting in the same location does not take nearly as much time as the original exposure. In field operations with properly placed bait troughs, exposing toxic baits for house finch control is amazingly selective; and the percentage of innocent birds killed is exceedingly low, generally a small fraction of one percent.

Where possible, dead birds should be recovered and buried. Look for dead birds at all perching and roosting sites. There appears to be little possibility of secondary hazard, however, all precautions should be taken.

The use of large traps for controlling house finches is a recent development here in California. Modified Australian Crow (MAC) Traps are most frequently used, though more and more cotton trailers are being converted for this use.

Traps used extensively for starling control (W. R. Clark 1967) have been rewired using aviary netting or hardware cloth of one-half inch mesh. Plans for constructing starling traps are available (University of California Extension Service - OSA #129; California Department of Agriculture - CDA 1965) and these can be modified by using the wire size mentioned above. The entrance board used for starlings (slot 1-3/4 inches wide) will work satisfactorily; however, a more successful entrance has been developed with two parallel 1-1/2 inch slots spaced two inches apart, each slot being six feet in length. The entrance board is constructed of 3/8 inch plywood, sixteen inches wide by eight feet in length. Three reinforcing strips, made of 1" by 3" by 6' long lumber are mounted (nailed and glued) perpendicular to the plane of the entrance board. Two of the strips are placed along the outside edges of the two slots and the other strip is mounted in the center of the board.

These MAC traps have been used successfully for two years now in a variety of situations and placement considerations are the same as those for putting up troughs; examples: near

telephone lines, wood piles, dead trees, and near areas of crop depredation. Some traps have been mounted on trailers, others have been placed on pallets for pick-up by forklifts, and most commonly they are just set up on the ground at a suitable location.

Orange County Department of Agriculture personnel (Pope, personal communication) are developing a bottom entrance for MAC traps that will have great possibilities in bird control. Most importantly, I think, is the fact that traps not only work well in controlling this species, but they are selective and can be used for a number of other bird species. Recently, I used one MAC trap and a converted cotton trailer to remove over 10,000 cedar waxwings *Bombycilla cedrorum* in six days from a processing plant where they were contaminating foodstuffs. These birds were taken 20 miles up their migration route and released. This is just one example of the diversity of use these traps are capable of. Cotton trailers 20 to 30 feet long which have been converted into traps are just enlarged versions of MAC traps. The obvious advantages of this type trap with their large capacity and easy mobility have been proven in the field.

Both styles of traps have been, on many instances, equipped with automatic watering and feeding devices with capacities sufficiently large to sustain the birds for a month without need of replenishing. A write-up on these devices is in the process of being drafted. Traps are also used as decoy stations. The birds in the trap act to decoy other house finches into the proximity of bait troughs attached to the trap or placed on stands nearby. These decoy stations have enticed finches from over one half mile away into bait troughs.

Birds to be destroyed are removed from the trap in a cage. The trap should be outfitted with a sliding door exit which can be easily opened and closed. Birds are herded in to the cage and the exit door closed. Birds can then be destroyed by fumigation in a chamber designed to accommodate the cage. Most of us use carbon monoxide gas (auto exhaust). Attach a hose from the exhaust pipe of your car to the fumigation chamber. In five minutes or so the act is accomplished. Burn or bury all dead birds.

A resume of the effectiveness of the trapping and baiting program carried out at the S & J Ranch in Madera is included with this paper. The substantial reduction in depredation by house finches to the fig crop is a testimonial to the effectiveness of these two methods of control.

Bio-acoustical devices have been used for house finch control (Boudreau 1962) for a number of years with varying degrees of control. Recently because of a greater effort on the part of researchers there has been considerable improvement in this technique. Two companies (Jenning Industries 1965 and Av-Alarm Corporation 1968) have publications on the use of their bio-acoustical devices. California Department of Agriculture personnel in Weed and Vertebrate Pest Control have reported successes with these units (Haworth, personal communication). These devices seem to require the same effort for successful treatment as does the exposure of toxic baits. One cannot just put these units in the field and expect the bird problems to disappear.

#### CONCLUSION

The exposure of toxic bait is still the most common form of house finch control in this State. I believe that the use of traps and bio-acoustic devices as methods of avian management will increase. Our goal should be to learn to adapt avian biology to meet our needs.

Hopefully this paper has added to the knowledge of house finch control as practiced in California. Most importantly, if an understanding of the conscientiousness with which State and county agencies undertake their responsibilities toward safeguarding wildlife, yet, reducing the threat of agricultural damage has been conveyed to the reader, I will be rewarded.

It is significant that these control methods have been demonstrated to be Safe, Selective, and Successful when used by individuals properly trained in the ecology of the species.

# HOUSE FINCH CONTROL SUMMARY - S & J RANCH<sup>1</sup> - (Callimyrna figs only)

PRODUCTION AND CROP LOSS	1967	1968	1969
Age of Trees (years)	4 - 6	4 - 7	5 - 8
Acres in Production	91.2	108	105
<u>Harvest Data</u>			
Merchantable Figs	14,031 lb.	52,404 lb.	117,120 lb.
Culls	3,119 lb.	6,811 lb.	12,003 lb.
Total Harvest	<u>17,150 lb.</u>	<u>59,215 lb.</u>	<u>129,123 lb.</u>
Yield per Acre	187 lb.	548 lb.	1,186 lb.
Percent Bird Damage to Total Harvest (all bird species)	11%	2.4%	1.4%
Percent Culls to Total Harvest	18%	11.5%	10%
<u>Itemized Cull Loss in percent</u>			
Mechanical, Rot & Diseases	39.0%	70.0%	86.0%
Birds other than Starlings <sup>2</sup>	60.0%	16.0%	14.0%
Starlings	1.0%	5.0%	0
<u>CONTROL DATA</u>			
<u>Expenses</u>			
Traps	{none}	1 @ \$300	{none}
Troughs and Stands	"	100 @ \$200	{none}
Rape Seed	"	400 lb @ \$20/cwt	200 lb @ \$20/cwt
Canary Seed	"	337.5 lb @ \$20/cwt	200 lb @ \$30/cwt
Labor	"	(no estimate)	\$130.00
Total		<u>\$690.00</u>	<u>\$230.00</u>
<u>House Finches Taken<sup>3</sup></u>			
Traps	{none}	5,000	8,000
Polson	"	30,000	10,000
Total		<u>35,000</u>	<u>18,000</u>
<u>Duration of Control Work</u>	-----	Feb-Sept (8 mo)	Jan-Sept (8 mo)

<sup>1</sup>S & J Ranch is a moderately large farming operation, approximately 5,000 acres in size.

<sup>2</sup>Primarily house finches.

<sup>3</sup>Bird estimates based on line transects of perching and roost areas. Trap numbers are accurate to within 200 + or - house finches.

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